AMENDMENT TO THE CLAIMS:

Please amend the claims as follows:

Please delete the subtitle "PATENT CLAIMS" and insert the following:

What is claimed is:

Please cancel claims 1-11, and substitute claims 12-31:

12. A magnetic field sensor for the measurement of at least one component of a magnetic field, comprising

a ring-shaped ferromagnetic core attached to a semiconductor chip that spans a plane with the at least one component of the magnetic field to be measured and that serves as magnetic field concentrator, whereby the ferromagnetic core is magnetized with a predetermined magnetization,

a read-out sensor, whereby the read-out sensor comprises at least one sensor that is integrated into the semiconductor chip and arranged in the vicinity of an outer edge of the ferromagnetic core and that measures the at least one component of the magnetic field,

and an excitation coil and an electronic circuit for the temporary application of a current to the excitation coil in order to restore the predetermined magnetization in the ferromagnetic core.

13. The magnetic field sensor of claim 12, wherein the ferromagnetic core is circularly magnetized.

14. The magnetic field sensor according to claim 12, wherein the excitation coil comprises at least one winding that encloses the ring of the ferromagnetic core.

15. The magnetic field sensor according to claim 13, wherein the excitation coil comprises at least one winding that encloses the ring of the ferromagnetic core.

16. The magnetic field sensor according to claim 12, wherein the ferromagnetic core is radially magnetized.

17. The magnetic field sensor according to claim 16, wherein the excitation coil comprises a flat coil with turns which run spirally underneath the ferromagnetic core.

18. The magnetic field sensor according to claim 12, wherein the read-out sensor comprises at least one Hall element.

19. The magnetic field sensor according to claim 13, wherein the read-out sensor comprises at least one Hall element.

20. The magnetic field sensor according to claim 16, wherein the read-out sensor comprises at least one Hall element.

21. The magnetic field sensor according to claim 12, wherein the read-out sensor comprises two Hall elements that are arranged at diametrically opposite locations in relation to an axis of symmetry of the ferromagnetic core.

22. The magnetic field sensor according to claim 13, wherein the read-out sensor comprises two Hall elements that are arranged at diametrically opposite locations in relation to an axis of symmetry of the ferromagnetic core.

23. The magnetic field sensor according to claim 16, wherein the read-out sensor comprises two Hall elements that are arranged at diametrically opposite locations in relation to an axis of symmetry of the ferromagnetic core.

24. The magnetic field sensor according to claim 12, wherein a width of the ring of the ferromagnetic core amounts to less than five percent of a diameter of the ferromagnetic core and wherein a height of the ring of the ferromagnetic core amounts to less than five percent of the diameter of the ferromagnetic core.

25. The magnetic field sensor according to claim 13, wherein a width of the ring of the ferromagnetic core amounts to less than five percent of a diameter of the ferromagnetic core and wherein a height of the ring of the ferromagnetic core amounts to less than five percent of the diameter of the ferromagnetic core.

26. The magnetic field sensor according to claim 16, wherein a width of the ring of the ferromagnetic core amounts to less than five percent of a diameter of the ferromagnetic core and wherein a height of the ring of the ferromagnetic core amounts to less than five percent of the diameter of the ferromagnetic core.

27. The magnetic field sensor according to claim 21, wherein a width of the ring of the ferromagnetic core amounts to less than five percent of a diameter of the ferromagnetic core and wherein a height of the ring of the ferromagnetic core amounts to less than five percent of the diameter of the ferromagnetic core.

28. The magnetic field sensor according to claim 22, wherein a width of the ring of the ferromagnetic core amounts to less than five percent of a diameter of the ferromagnetic core and wherein a height of the ring of the ferromagnetic core amounts to less than five percent of the diameter of the ferromagnetic core.

29. A method for operation of a magnetic field sensor for the measurement of at least one component of a magnetic field, in which the magnetic field sensor comprises a ring-shaped ferromagnetic core attached to a semiconductor chip the ferromagnetic core spanning a plane with the at least one component of the magnetic field to be measured and serving as magnetic field concentrator, and a read-out sensor having at least one sensor integrated into the semiconductor chip and arranged in the vicinity of an outer edge of the ferromagnetic core whereby the read-out sensor measures the at least one component of the magnetic field, the method comprising the step of magnetizing the ferromagnetic core at specific times by temporary application of a current to an excitation coil for restoring magnetzation of the ferromagnetic core.

30. The method of claim 29, wherein the current applied to the excitation coil for restoring the magnetization of the ferromagnetic core is a direct current pulse, whereby a maximum of the direct current pulse produces a magnetic field that is greater than a coercive field strength of the material of the ferromagnetic core.

31. The method of claim 29, wherein the temporary application of current to the excitation coil at specific times comprises the steps of:

a) applying a first direct current pulse to the excitation coil, whereby the current flows through the excitation coil in a first direction with a maximum of the direct current pulse producing a magnetic field that is greater than a coercive field strength of the material of the ferromagnetic core;

b) then reading out an output signal of the read-out sensor;

c) applying a second direct current pulse to the excitation coil, whereby the current flows through the excitation coil in a second direction opposite to the first direction with the maximum of the direct current pulse producing a magnetic field that is greater than the coercive field strength of the material of the ferromagnetic core;

d) then reading out the output signal of the read-out sensor; and

e) summing the output signals of the read-out sensor measured in steps b and d.